

JMTK 3.2 Joint Mapping Tool Kit (JMTK) Functional Requirements

For those stated requirements below, the Joint Mapping Tool Kit (JMTK) services shall:

JMTK 3.2.1 Geospatial Analysis.

3.2.1.1 Support application selection of input and output units of measurement for all functions.

Traceability: FRD 1.1
Priority 1

3.2.1.1.1 The variety of units will include

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.1 Dates

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.2 Hours

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.3 Minutes

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.4 Seconds

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.5 Feet

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.6 Meters

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.7 Fathoms

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.8 Kilometers

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.9 Square kilometers

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.10 Hectares

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.11 Nautical miles

Traceability: FRD 1.1
Priority 1

3.2.1.1.1.12 Square miles	Traceability: FRD 1.1 Priority 1
3.2.1.1.1.13 Degrees	Traceability: FRD 1.1 Priority 1
3.2.1.1.1.14 Minutes of arc	Traceability: FRD 1.1 Priority 1
3.2.1.1.1.15 Seconds of arc	Traceability: FRD 1.1 Priority 1
3.2.1.1.1.16 Radians.	Traceability: FRD 1.1 Priority 1
3.2.1.1.2 Degrees may be input in the following formats:	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.1 Degrees, minutes seconds mode	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.2 Degrees, decimal degree	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.3 Degrees, minutes, and decimal minute	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.4 Entry of degrees will allow for at least seven decimal places	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.5 Entry of seconds will allow for at least three decimal places.	Traceability: FRD 1.1 Priority 1
3.2.1.1.2.6 Entry of hemisphere will be allowed in (NSEW) and (+-) format	Traceability: FRD 1.1 Priority 1
3.2.1.1.3 The time and date format will be transmitted and entered in the YYYYMMDD HHMMSS	Traceability: FRD 1.1 Priority 1
3.2.1.1.4 Set the unit of measurement to be used in the display of all angle calculations	Traceability: FRD 1.1 Priority 1
3.2.1.1.5 Set the unit of measurement for the display of all elevation calculations.	Traceability: FRD 1.1 Priority 1

- 3.2.1.1.6 Set the unit of measurement for the display of all position calculations.
Traceability: FRD 1.1
Priority 1
- 3.2.1.2 Will perform terrain masking for one or more ground based observers utilizing elevation data format as they apply.
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.1 Observer height will be considered
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.2 Target height will be considered
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.3 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.4 The terrain-shadowed areas will be represented for any above ground altitude, including ground level.
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.5 Terrain masking can be constrained by
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.5.1 Two-dimensional range
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.5.2 Three-dimensional range
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.5.3 Constrained by sectors of a circle or sphere
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.6 Will permit accounting for atmospheric refraction effects.
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.7 Provide the capability to filter the reduced resolution elevation data such that the following values are retrievable over a specified geographic area.
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.7.1 Maximum elevation values
Traceability: FRD 1.2
Priority 1
- 3.2.1.2.7.2 Minimum elevation values
Traceability: FRD 1.2
Priority 1

3.2.1.2.7.3 Average elevation values	Traceability: FRD 1.2 Priority 1
3.2.1.2.8 The system will provide support for both optical and electromagnetic LOS calculations. Frequencies to be supported for electromagnetic LOS are to be supplied	Traceability: FRD 1.2 Priority 1
3.2.1.2.9 Provide the capability for fast retrieval of DTED data in the systems that are not extremely powerful.	Traceability: FRD 1.2 Priority 1
3.2.1.2.10 Set the range to be used to generate terrain masks	Traceability: FRD 1.2 Priority 1
3.2.1.2.11 Set the altitude to be used to cut and display a terrain mask	Traceability: FRD 1.2 Priority 1
3.2.1.2.12 Generate the Min/Max elevation of a Feature	Traceability: FRD 1.2 Priority 1
3.2.1.2.13 Generate a Terrain Mask.	Traceability: FRD 1.2 Priority 1
3.2.1.3 Calculate point-to-point line-of-sight (LOS) utilizing elevation data retrieved from the Spatial Database Management System (SDBMS).	Traceability: FRD 1.3 Priority 2
3.2.1.3.1 Observer height will be considered	Traceability: FRD 1.3 Priority 2
3.2.1.3.2 Target height will be considered	Traceability: FRD 1.3 Priority 2
3.2.1.3.3 Three dimensional range will be considered	Traceability: FRD 1.3 Priority 2
3.2.1.3.4 Provide probability of detection isopleths based on the specified sensor or weapon systems assets and incorporate aircraft radar cross section if included in the application-specified	Traceability: FRD 1.3 Priority 2
3.2.1.3.5 Calculate an area that can be traversed by a moving target based on inputs of	Traceability: FRD 1.3 Priority 2
3.2.1.3.5.1 Elapsed time	Traceability: FRD 1.3 Priority 2

3.2.1.3.5.2 Entity velocity

Traceability: FRD 1.3
Priority 2

3.2.1.3.5.3 This area will be included in LOS outputs for airborne and ground Targets.

Traceability: FRD 1.3
Priority 2

3.2.1.3.6 Incorporate terrain masking to determine the altitude above ground level at which aircraft and Entity ground asset intervisibility occurs

Traceability: FRD 1.3
Priority 2

3.2.1.3.7 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids

Traceability: FRD 1.3
Priority 2

3.2.1.3.8 Support both optical and electromagnetic LOS calculations, Frequencies to be supported for electromagnetic LOS are to be supplied. The effects and conditions to be considered are

Traceability: FRD 1.3
Priority 2

3.2.1.3.8.1 Surface structures

Traceability: FRD 1.3
Priority 2

3.2.1.3.8.2 Time-of-day

Traceability: FRD 1.3
Priority 2

3.2.1.3.8.3 Elevation model accuracy

Traceability: FRD 1.3
Priority 2

3.2.1.3.8.4 Atmospheric and tropospheric conditions will be considered

Traceability: FRD 1.3
Priority 2

3.2.1.4 Calculate vegetation effects on intervisibility utilizing obscuring features found in any of the DMA feature data bases available.

Traceability: FRD 1.4
Priority 3

3.2.1.4.1 Obscuring features are:

Traceability: FRD 1.4
Priority 3

3.2.1.4.1.1 Vegetation

Traceability: FRD 1.4
Priority 3

3.2.1.4.1.2 Urban areas

Traceability: FRD 1.4
Priority 3

3.2.1.4.1.3 Tactical obscurants (e.g. smoke, weather obscurants such as fog)

Traceability: FRD 1.4
Priority 3

- 3.2.1.4.2 This capability will augment any terrain masking or line-of-sight calculation.
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.3 Calculations will take into account selected feature attributes
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.3.1 Deciduous vs. coniferous
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.3.2 Foliage height
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.3.3 Canopy closure
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.3.4 Season
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.4 Calculations will take into account three operator entered structure attributes
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.4.1 Structure height
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.4.2 Structure width
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.4.3 Structure midpoint
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.5 Results will be represented in at least three categories:
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.5.1 Definitely masks target
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.5.2 Definitely does not mask target
Traceability: FRD 1.4
Priority 3
- 3.2.1.4.5.3 May have an effect on LOS
Traceability: FRD 1.4
Priority 3
- 3.2.1.5 Calculate distance by combining and utilizing
Traceability: FRD 1.5
Priority 1

- 3.2.1.5.1 Great circle technique
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.2 Rhumb line technique
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.3 Straight line technique
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.4 Technique used will be application selectable or automatically provided, depending on distance measurement desired (e.g., straight line for a change in altitude; great circle for a common elevation)
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.5 Measure ground features or arbitrary ground paths for
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.5.1 Gridded products
Traceability: FRD 1.5
Priority 1
- 3.2.1.5.5.2 Vector products
Traceability: FRD 1.5
Priority 1
- 3.2.1.6 Provide capability to automatically identify locations for threats and sensors which optimize the area visible to that Entity and sensor.
Traceability: FRD 1.6
Priority 3
- 3.2.1.6.1 Capability would only apply to areas found within either the threat or the sensor location error ellipses
Traceability: FRD 1.6
Priority 3
- 3.2.1.6.2 Capability would utilize elevation data retrieved from the SDBMS.
Traceability: FRD 1.6
Priority 3
- 3.2.1.6.3 Capability will be implemented so as to apply this function to selected threats and sensors.
Traceability: FRD 1.6
Priority 3
- 3.2.1.6.4 The capability will be provided to relocate the threat/sensor laterally (parallel to the surface), vertically, or both laterally and vertically.
Traceability: FRD 1.6
Priority 3
- 3.2.1.7 Provide sensor prediction capabilities which will predict, at moderate fidelity, the output of specific families of sensors to the detail of the data available.
Traceability: FRD 1.7
Priority 2

3.2.1.7.1 The sensor families featured will include	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.1 Real beam ground map radar	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.2 Pulse doppler radar	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.3 Synthetic aperture radar	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.4 Low light level television	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.5 Forward looking infrared (FLIR)	Traceability: FRD 1.7 Priority 2
3.2.1.7.1.6 Targeting infrared.	Traceability: FRD 1.7 Priority 2
3.2.1.7.2 Predictions will be featured in the orientation that the real sensors are represented to the observer	Traceability: FRD 1.7 Priority 2
3.2.1.7.3 The earth curvature will be considered, with the curvature being modeled by selectable standard spheroids	Traceability: FRD 1.7 Priority 2
3.2.1.7.4 The simulation will include	Traceability: FRD 1.7 Priority 2
3.2.1.7.4.1 Radar simulation.	Traceability: FRD 1.7 Priority 2
3.2.1.7.4.2 FLIR simulation.	Traceability: FRD 1.7 Priority 2
3.2.1.7.4.3 Synthetic aperture radar (SAR) simulation.	Traceability: FRD 1.7 Priority 2
3.2.1.8 Provide the capability to generate a terrain profile from elevation data and vertical obstruction data provided by the application.	Traceability: FRD 1.8 Priority 1

- 3.2.1.8.1 Profile will be calculated as
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.1.1 Straight line segment
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.1.2 Series of line segments
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.1.3 The data will be available as a linear feature from the spatial data base
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.2 Have capability to calculate LOS with the terrain profile
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.3 Start and end location for LOS calculations will each have a selectable height
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.4 The earth curvature will be considered in the calculation, with the curvature being modeled by selectable standard spheroids
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.5 Optionally, the profile view will use as the elevation of the path the highest elevation within a application-specified distance to the right and left of the profile baseline path
Traceability: FRD 1.8
Priority 1
- 3.2.1.8.6 Mark the locations of vertical obstructions available in the spatial database within a specified distance to the right and left of the profile baseline path.
Traceability: FRD 1.8
Priority 1
- 3.2.1.9 Provide the capability to generate terrain perspective views utilizing. (See Paragraph 2.20)
Traceability: FRD 1.9
Priority 2
- 3.2.1.9.1 Digital Terrain Elevation Data
Traceability: FRD 1.9
Priority 2
- 3.2.1.9.2 Geocoded imagery
Traceability: FRD 1.9
Priority 2
- 3.2.1.9.3 Any features available in the spatial data base, including overview information
Traceability: FRD 1.9
Priority 2
- 3.2.1.9.4 Various ways to represent the terrain will be available
Traceability: FRD 1.9
Priority 2

3.2.1.9.4.1 Smooth	Traceability: FRD 1.9 Priority 2
3.2.1.9.4.2 Faceted	Traceability: FRD 1.9 Priority 2
3.2.1.9.4.3 Wire net	Traceability: FRD 1.9 Priority 2
3.2.1.9.4.4 Shading can be arbitrary and may be simulating sun, moon, other source, or arbitrary placement of lighting.	Traceability: FRD 1.9 Priority 2
3.2.1.9.4.5 Elevation contour banded	Traceability: FRD 1.9 Priority 2
3.2.1.9.5 Perspective views may be generated from any observer position and orientation to a position of interest located at any height	Traceability: FRD 1.9 Priority 2
3.2.1.9.6 The perspective angular field of view, depth of view and altitude (i.e. roll, pitch, yaw, etc.) of generation will be totally selectable	Traceability: FRD 1.9 Priority 2
3.2.1.9.7 The light source position will be selectable by date and time or by arbitrary placement (azimuth and declination)	Traceability: FRD 1.9 Priority 2
3.2.1.9.8 The earth horizon will be factored into view generation	Traceability: FRD 1.9 Priority 2
3.2.1.9.9 A representation of the desired route of the observer will be included.	Traceability: FRD 1.9 Priority 2
3.2.1.9.10 Include the capability to generate a perspective view, at any point along the a path of locations	Traceability: FRD 1.9 Priority 2
3.2.1.9.11 Provide lighting effects of	Traceability: FRD 1.9 Priority 2
3.2.1.9.11.1 Clear sky	Traceability: FRD 1.9 Priority 2
3.2.1.9.11.2 Hazy sky	Traceability: FRD 1.9 Priority 2

3.2.1.9.11.3 Overcast sky	Traceability: FRD 1.9 Priority 2
3.2.1.9.11.4 Fog	Traceability: FRD 1.9 Priority 2
3.2.1.9.11.5 Haze	Traceability: FRD 1.9 Priority 2
3.2.1.9.11.6 Precipitation	Traceability: FRD 1.9 Priority 2
3.2.1.9.12 View quality options of lighting effects and visibility attenuation will, be calculated based on weather forecasts or historical weather conditions	Traceability: FRD 1.9 Priority 2
3.2.1.9.13 Generate perspective views for	Traceability: FRD 1.9 Priority 2
3.2.1.9.13.1 Visual prediction	Traceability: FRD 1.9 Priority 2
3.2.1.9.13.2 Radar	Traceability: FRD 1.9 Priority 2
3.2.1.9.13.3 Synthetic aperture radar prediction	Traceability: FRD 1.9 Priority 2
3.2.1.10 Provide a capability to generate perspective views of threat envelopes coupled with a terrain representation of the area involved in the scene.	Traceability: FRD 1.10 Priority 3
3.2.1.10.1 Envelopes will vary in representation so as to portray the overlap of the threat envelopes for multiple sensors.	Traceability: FRD 1.10 Priority 3
3.2.1.10.2 Envelopes will be displayed with terrain and feature representations as output from the terrain perspective viewing function excluding the imagery overlay option.	Traceability: FRD 1.10 Priority 3
3.2.1.10.3 Perspective views may be generated from any observer position and orientation to a position of interest located at any height. This capability to include reversing the view and looking from the specific position of interest toward the observer.	Traceability: FRD 1.10 Priority 3

3.2.1.10.4 Features highlighted in the perspective scene (including the target) that are terrain masked from the observer will be represented as such.

Traceability: FRD 1.10
Priority 3

3.2.1.10.5 The perspective angular field of view, depth of view and attitude (i.e.; roll, pitch, yaw) of generation will be totally selectable

Traceability: FRD 1.10
Priority 3

3.2.1.10.6 The light source (i.e. sun or moon) position will be selectable by date and time or by arbitrary placement (azimuth and declination)

Traceability: FRD 1.10
Priority 3

3.2.1.10.7 The earth horizon will be factored into view generation

Traceability: FRD 1.10
Priority 3

3.2.1.10.8 A representation of the desired route of the observer will be included

Traceability: FRD 1.10
Priority 3

3.2.1.10.9 The specific shape of the threat envelope will be selectable by defining the sensor location, height, range, azimuth, inclination, horizontal and vertical angular fields of view. Only the height and range of the sensor need be specified.

Traceability: FRD 1.10
Priority 3

3.2.1.10.10 The environment will be calculated using a database of threat system characteristics. Ground-based, airborne, and shipborne weapon systems, early warning and ground control intercept radar and small arms and armament will be available.

Traceability: FRD 1.10
Priority 3

3.2.1.10.11 Provide the capability to provide probability of detection isopleths (lines of equal probability) for specified threat systems and specific aircraft.

Traceability: FRD 1.10
Priority 3

3.2.1.10.12 Interface will be allowed to choose specified probabilities for which to display the isopleths.

Traceability: FRD 1.10
Priority 3

3.2.1.10.13 Calculate the maximum detection range of a radar.

Traceability: FRD 1.10
Priority 3

3.2.1.11 Perform terrain feature categorization for a given AOI using selected terrain.

Traceability: FRD 1.11
Priority 2

3.2.1.11.1 Allow the selection by type and attribute of surface feature coverage and vertical obstructions. This includes

Traceability: FRD 1.11
Priority 2

3.2.1.11.1.1 Vegetation	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.2 Soils	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.3 Transportation	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.4 Drainage	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.5 Slope	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.6 Industry	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.7 Obstacles	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.8 Generate the vector data for ridges and channels.	Traceability: FRD 1.11 Priority 2
3.2.1.11.1.9 Calculate the magnetic compass declination for coordinate and date	Traceability: FRD 1.11 Priority 2
3.2.1.12 Step-through	Traceability: FRD 1.12 Priority 2
3.2.1.12.1 Calculate a sequence of windows representing discrete views, for any perspective view type listed in paragraph 1.9, and any look angle and field of view.	Traceability: FRD 1.12 Priority 2
3.2.1.12.2 Provide the capability to specify the starting and ending points.	Traceability: FRD 1.12 Priority 2
3.2.1.12.2.1 Route fly-through	Traceability: FRD 1.12 Priority 2
3.2.1.12.2.2 The number of window updates to be displayed along this route	Traceability: FRD 1.12 Priority 2

3.2.1.12.2.3 Window updates will correspond to equally-spaced changes in position of the viewpoint along the route between the starting and ending points of the fly-through

Traceability: FRD 1.12
Priority 2

3.2.1.12.3 Provide the fly-through sequence as to

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.1 Start

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.2 Stop

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.3 Pause

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.4 Restart

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.5 Reverse

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.6 Forward

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.7 Slow

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.8 Speed-up

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.9 Go to start

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.10 Go to end

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.11 Go to specified location

Traceability: FRD 1.12
Priority 2

3.2.1.12.3.12 Go to specified time

Traceability: FRD 1.12
Priority 2

3.2.1.13 Have the capability to perform cross country movement (CCM) analysis using data retrieved from the SDBMS.

Traceability: FRD 1.13
Priority 2

3.2.1.13.1 Compute a maximum speed for a selected entity and given AOI, based on
Traceability: FRD 1.13
Priority 2

3.2.1.13.1.1 Slope

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.2 Vegetation

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.3 Soil

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.4 Surface roughness

Traceability: FRD 1.13
Priority 2

3.2.1.13.1.5 Drainage features

Traceability: FRD 1.13
Priority 2

3.2.1.13.2 The analysis can be restricted to

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.1 On-road-only

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.2 Off-road-only

Traceability: FRD 1.13
Priority 2

3.2.1.13.2.3 Mixed travel

Traceability: FRD 1.13
Priority 2

3.2.1.13.3 Consider the effects of weather conditions

Traceability: FRD 1.13
Priority 2

3.2.1.13.3.1 Precipitation over time

Traceability: FRD 1.13
Priority 2

3.2.1.13.3.2 Fog

Traceability: FRD 1.13
Priority 2

3.2.1.13.3 Temperature	Traceability: FRD 1.13 Priority 2
3.2.1.13.4 The results will be depicted as areas of go, slow-go, no-go and unevaluated for the selected vehicle type or aggregate of vehicles or other entities.	Traceability: FRD 1.13 Priority 2
3.2.1.13.5 The reasons for no-go and slow-go will be computed for each region (e.g. soil strength, slope, obstacle, braking)	Traceability: FRD 1.13 Priority 2
3.2.1.13.6 Perform cross country movement on the specified surface material code (SMC) product.	Traceability: FRD 1.13 Priority 2
3.2.1.13.7 Perform cross country movement on the specified cross country movement (CCM) information product.	Traceability: FRD 1.13 Priority 2
3.2.1.13.8 Generate a path profile composed of a series of latitudes, longitudes, and altitudes at each point.	Traceability: FRD 1.13 Priority 2
3.2.1.14 Perform time-of-travel computations.	Traceability: FRD 1.14 Priority 2
3.2.1.14.1 Provide the capability to	Traceability: FRD 1.14 Priority 2
3.2.1.14.1.1 Select a vehicle type	Traceability: FRD 1.14 Priority 2
3.2.1.14.1.2 Define a vehicle type	Traceability: FRD 1.14 Priority 2
3.2.1.14.1.3 Edit a vehicle type	Traceability: FRD 1.14 Priority 2
3.2.1.14.2 Provide the capability to select time of travel computations according to a selected:	Traceability: FRD 1.14 Priority 2
3.2.1.14.2.1 Vehicle type	Traceability: FRD 1.14 Priority 2
3.2.1.14.2.2 Restriction to on-road-only	Traceability: FRD 1.14 Priority 2

- 3.2.1.14.2.3 Restriction to off-road-only
Traceability: FRD 1.14
Priority 2
- 3.2.1.14.2.4 Mixed travel
Traceability: FRD 1.14
Priority 2
- 3.2.1.14.3 Time of travel prediction will include the effects of known obstacles
Traceability: FRD 1.14
Priority 2
- 3.2.1.14.4 Provide the capability to determine and display:
Traceability: FRD 1.14
Priority 2
- 3.2.1.14.4.1 Total time of travel between specified start and end locations
Traceability: FRD 1.14
Priority 2
- 3.2.1.14.4.2 Total and partial time of travel along a directed path broken into multiple specified segments.
Traceability: FRD 1.14
Priority 2
- 3.2.1.15 Provide the capability to select unit movement prediction analysis according to
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.1 Unit echelon and composition
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.2 Restriction to on-road-only, off-road-only, or mixed travel.
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.3 Shortest path (straight-line) or fastest path between way-points, and time interval at which locations are reported
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.4 Unit movement prediction will also include the effects of known obstacles.
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.5 Provide the capability to determine and display the predicted unit movement path between specified start and end locations along with time-stamped locations along the path.
Traceability: FRD 1.15
Priority 2
- 3.2.1.15.6 Provide the capability to determine and display the total and partial predicted unit movements along a directed path which includes one or more specified way-points. Time-stamped locations along the path will also be displayed.
Traceability: FRD 1.15
Priority 2
- 3.2.1.16 Calculate mobility corridors.
Traceability: FRD 1.16
Priority 2

- 3.2.1.16.1 Provide the capability to select a unit echelon and composition from a database of units.
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.2 Provide the capability to select weather conditions based on either historical patterns or current or projected measurements.
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.3 Provide the capability to determine cross-country movement potential (trafficability) within a specified geographic extent. Cross-country movement potential will include the effects of:
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.3.1 Weather (including frozen rivers)
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.3.2 The selected unit echelon/composition (vehicles and/or dismounted combatants).
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.4 Provide the capability to define an analysis area based on a specified set of perimeter locations.
Traceability: FRD 1.16
Priority 2
- 3.2.1.16.5 Provide the capability to determine and display mobility corridors within a specified analysis area according to a selected unit echelon/composition, previous cross-country movement potential analysis.
Traceability: FRD 1.16
Priority 2
- 3.2.1.17 Support air avenues of approach.
Traceability: FRD 1.17
Priority 2
- 3.2.1.17.1 Provide the capability to select a helicopter group configuration and composition from a database of helicopters.
Traceability: FRD 1.17
Priority 2
- 3.2.1.17.2 Provide the capability to determine air movement potential within a specified geographic extent. Air movement potential will include the effects of:
Traceability: FRD 1.17
Priority 2
- 3.2.1.17.2.1 Weather
Traceability: FRD 1.17
Priority 2
- 3.2.1.17.2.2 Specified lower air corridor altitude
Traceability: FRD 1.17
Priority 2
- 3.2.1.17.2.3 Specified upper air corridor altitude
Traceability: FRD 1.17
Priority 2

3.2.1.17.2.4 The selected helicopter group configuration and composition

Traceability: FRD 1.17
Priority 2

3.2.1.17.3 Air movement potential will also include the effects of vertical obstacles, terrain (e.g. mountains, canyons), and vegetation

Traceability: FRD 1.17
Priority 2

3.2.1.18 Provide the capability to determine and display air mobility corridors within a specified analysis area according to a selected helicopter group configuration/composition, and previous air movement potential analysis.

Traceability: FRD 1.18
Priority 2

3.2.1.19 Have the capability to calculate and store the area gradient (i.e. slope), including direction in a particular area of interest from elevation data. Be able to specify ranges such that gradients within a specified tolerance

Traceability: FRD 1.19
Priority 2

3.2.1.20 Compute the point-to-point slope, including direction, between two given points, based on elevation data DTED

Traceability: FRD 1.20
Priority 1

3.2.1.21 Have the capability to calculate the ridge and valley lines in a particular area of interest from DTED.

Traceability: FRD 1.21
Priority 1

3.2.1.21.1 Be able to vary the thresholds employed in generating these features

Traceability: FRD 1.21
Priority 1

3.2.1.21.1.1 Skeletonizing

Traceability: FRD 1.21
Priority 1

3.2.1.21.1.2 Broadening

Traceability: FRD 1.21
Priority 1

3.2.1.22 Perform trafficability analysis along a specified route for lines of communication and transportation.

Traceability: FRD 1.22
Priority 2

3.2.1.22.1 Calculate time to travel a given route based on the impedance factors of surface materials, segment width and slope.

Traceability: FRD 1.22
Priority 2

3.2.1.22.2 Collect options and determine the possible vehicle path.

Traceability: FRD 1.22
Priority 2

3.2.1.22.3 Calculate all possible radial paths and distances traversed of a vehicle for a given period of time from a given start point.

Traceability: FRD 1.22
Priority 2

3.2.1.22.4 Calculate all or specified number of shortest path through a road network given start and end points.

Traceability: FRD 1.22
Priority 2

3.2.1.22.5 Calculate all or specified number of optimal path.

Traceability: FRD 1.22
Priority 2

3.2.1.23 Have the capability to produce and save elevation tinted (color contour banded) depiction of the terrain data in 2-d (plan view).

Traceability: FRD 1.23
Priority 1

3.2.1.23.1 Capability to determine the minimum and maximum elevations in the selected region

Traceability: FRD 1.23
Priority 1

3.2.1.23.2 Allow selectable map scale, AOI size, base elevation, interval size and interval colors in the generation of the elevation tinted maps.

Traceability: FRD 1.23
Priority 1

3.2.1.24 Produce and save elevation shaded (light source relief shading) depiction of the terrain data in 2-d (plan view). The light source position will be selectable by the time and date of the desired depiction.

Traceability: FRD 1.24
Priority 2

3.2.1.24.1 Select scale, AOI size, and light source (i.e. sun, moon) position by date and time or arbitrary placement (i.e. azimuth and declination).

Traceability: FRD 1.24
Priority 2

3.2.1.25 Have the capability to combine raster, gridded, and vector data to form a single raster result.

Traceability: FRD 1.25
Priority 1

3.2.1.25.1 Both elevation tinted (color contour banding) and elevation shaded (light source relief shading) representations may be fused into a composite image (relief shaded elevation contour banded image).

Traceability: FRD 1.25
Priority 1

3.2.1.25.2 Support update of raster maps and charts with vector and image data.

Traceability: FRD 1.25
Priority 1

3.2.1.25.3 Support augmentation of imagery with vector data.

Traceability: FRD 1.25
Priority 1

3.2.1.25.4 Calculate the color histogram of the designated image area.	Traceability: FRD 1.25 Priority 1
3.2.1.26 Have the capability to produce a heading between two geographic coordinates.	Traceability: FRD 1.26 Priority 1
3.2.1.26.1 Headings will be produced in either	Traceability: FRD 1.26 Priority 1
3.2.1.26.1.1 True values	Traceability: FRD 1.26 Priority 1
3.2.1.26.1.2 Magnetic values	Traceability: FRD 1.26 Priority 1
3.2.1.26.2 Function will comply with DoD tech. Note TN 8222-01-87	Traceability: FRD 1.26 Priority 1
3.2.1.27 Perform precise monoscopic positioning based upon.	Traceability: FRD 1.27 Priority 2
3.2.1.27.1 Imagery managed by the SDBMS	Traceability: FRD 1.27 Priority 2
3.2.1.27.2 Calculate the accuracy of a position selected from image data.	Traceability: FRD 1.27 Priority 2
3.2.1.27.3 Calculate the horizontal accuracy of a position.	Traceability: FRD 1.27 Priority 2
3.2.1.27.4 Derive positional coordinates of selected points mensurated on.	Traceability: FRD 1.27 Priority 2
3.2.1.27.6.1 Standard ADRI	Traceability: FRD 1.27 Priority 2
3.2.1.27.6.2 CMS-formatted ADRI	Traceability: FRD 1.27 Priority 2
3.2.1.27.6.3 CIB imagery	Traceability: FRD 1.27 Priority 2
3.2.1.27.7 Calculate absolute error of point positions at 90% circular error (CE).	Traceability: FRD 1.27 Priority 2

3.2.1.27.7.1 Linear error (LE)	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2 Spherical error (SE) from contributors:	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.1 Elevation Data	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.2 ADRI standard imagery	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.3 CMS-formatted ADRI imagery and CIB	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.4 Displayed scale	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.5 Cursor precision	Traceability: FRD 1.27 Priority 2
3.2.1.27.7.2.6 Local geocoded imagery (if usable)	Traceability: FRD 1.27 Priority 2
3.2.1.28 Provide the capability to store and retrieve the results of analytical calculations with a time date stamp such that they can be called back at a later time.	Traceability: FRD 1.28 Priority 1

JMTK 3.2.2 Display Functionality Requirements

3.2.2.1 Support selection of input and output units of measurement for all functions. (Refer to Paragraph 1.1)	Traceability: FRD 2.1 Priority 1
3.2.2.2 Perform coordinate and datum transformations	Traceability: FRD 2.2 Priority 1
3.2.2.2.1 Convert latitude longitude coordinates from one datum to another.	Traceability: FRD 2.2 Priority 1
3.2.2.2.2 Convert a decimal degree to a radian value.	Traceability: FRD 2.2 Priority 1

- 3.2.2.2.3 Convert an alphanumeric GEOREF coordinate to latitude/longitude.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.4 Convert a lat/long coordinate to alphanumeric GEOREF.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.5 Convert lat/long to numeric UPS coordinates.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.6 Convert lat/long to numeric UTM coordinates.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.7 Convert a latitude/longitude coordinate to an alphanumeric UPS coordinate.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.8 Convert a latitude/longitude coordinate to an alphanumeric UTM coordinate.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.9 Convert numeric UPS coordinates to lat/long.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.10 Convert numeric UTM coordinates to lat/long.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.11 Convert a radian value to decimal degrees.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.12 Convert screen pixel positions to world (lat./long) positions.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.13 Convert an alphanumeric UPS coordinate to a latitude/ longitude coordinate.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.14 Convert an alphanumeric UTM coordinate to a latitude/ longitude coordinate.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.15 Convert view surface coordinates to lat/long.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.16 Convert lat/long to view surface coordinates.
Traceability: FRD 2.2
Priority 1
- 3.2.2.2.17 Set the southwest and northeast coordinates of the area of interest.
Traceability: FRD 2.2
Priority 1

3.2.2.2.18 Convert latitude/longitude to screen pixel positions.	Traceability: FRD 2.2 Priority 1
3.2.2.2.19 Support conversion of multiple coordinates	Traceability: FRD 2.2 Priority 1
3.2.2.2.20 Re-initialize the system by reloading the named display configuration file.	Traceability: FRD 2.2 Priority 1
3.2.2.3 Support and manage map windows and map layers.	Traceability: FRD 2.3 Priority 1
3.2.2.3.1 Provide support as to:	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.1 Create	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.2 Name	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.3 Delete	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.4 Hide	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.5 Expose	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.6 Draw	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.7 Refresh	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.8 Recenter	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.9 Catalog	Traceability: FRD 2.3 Priority 1
3.2.2.3.1.10 Snapshot map windows.	Traceability: FRD 2.3 Priority 1

3.2.2.3.2	Be able to select from a list of map windows according to their attributes or metadata.	Traceability: FRD 2.3 Priority 1
3.2.2.3.3	For a map window, be able to set or reset the	Traceability: FRD 2.3 Priority 1
3.2.2.3.3.1	Display scale	Traceability: FRD 2.3 Priority 1
3.2.2.3.3.2	Projection	Traceability: FRD 2.3 Priority 1
3.2.2.3.3.3	Window Size.	Traceability: FRD 2.3 Priority 1
3.2.2.3.4	Support setting and run-time adjustment of the map window display cache size.	Traceability: FRD 2.3 Priority 1
3.2.2.3.5	Be able to create a persistent representation of a map layer that can be	Traceability: FRD 2.3 Priority 1
3.2.2.3.5.1	Stored	Traceability: FRD 2.3 Priority 1
3.2.2.3.5.2	Retrieved	Traceability: FRD 2.3 Priority 1
3.2.2.3.5.3	Interchanged.	Traceability: FRD 2.3 Priority 1
3.2.2.3.6	Within a map window, provide support as to:	Traceability: FRD 2.3 Priority 1
3.2.2.3.6.1	Insert	Traceability: FRD 2.3 Priority 1
3.2.2.3.6.2	Remove	Traceability: FRD 2.3 Priority 1
3.2.2.3.6.3	(Re)order map layers in one or more map windows	Traceability: FRD 2.3 Priority 1

3.2.2.3.6.4 Update graphic depictions in a map layer for geographic data sets selected from the SDBMS, and using symbology selected from a symbology library.

Traceability: FRD 2.3
Priority 1

3.2.2.3.7 Be able to insert or remove one or more map layers into another map layer by reference.

Traceability: FRD 2.3
Priority 1

3.2.2.3.8 Support one background map layer in a map window.

Traceability: FRD 2.3
Priority 1

3.2.2.3.8.1 Be able to designate one map layer as a background map layer for a map window. This map layer is normally intended not to be updated frequently

Traceability: FRD 2.3
Priority 1

3.2.2.3.8.2 Be able to set the background map layer to be an application-supplied neutral-toned color.

Traceability: FRD 2.3
Priority 1

3.2.2.3.9 Support registration of servers (which may be application-supplied) that can be invoked upon application request to draw specialized map layers.

Traceability: FRD 2.3
Priority 1

3.2.2.3.10 Be able to translate between window coordinates and geocoordinates.

Traceability: FRD 2.3
Priority 1

3.2.2.4 Support and manage symbology libraries.

Traceability: FRD 2.4
Priority 1

3.2.2.4.1 Include the Common Warfighter Symbology library compliant with MIL-STD 2525

Traceability: FRD 2.4
Priority 1

3.2.2.4.2 Include a default symbology library for each vector data product supported by the SDBMS

Traceability: FRD 2.4
Priority 1

3.2.2.4.3 Support adding into a symbology library an association between a symbolization behavior and an SDBMS feature(s), and value or range of values for those attribute(s).

Traceability: FRD 2.4
Priority 1

3.2.2.4.4 Other than the Common Warfighter Symbology library will have the capability to

Traceability: FRD 2.4
Priority 1

3.2.2.4.4.1 Create symbology libraries

Traceability: FRD 2.4
Priority 1

3.2.2.4.4.2 Delete symbology libraries.

Traceability: FRD 2.4
Priority 1

- 3.2.2.4.5 Be able to retrieve a graphic object from a symbology library.
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.6 Be able to set and retrieve relative positions for annotations (text and otherwise) for a graphic object in a symbology library.
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.7 Support addition of symbology definitions and associated graphic expressions to the Common Warfighter Symbology library according to MIL-STD 2525.
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.8 Support additions and deletions of symbology definitions and associated graphic expressions to other libraries.
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.9 Support interchange of nonstandard symbols. If an application has a symbol that is not in the official MIL-STD 2525, but adheres to the encoding convention, then it should transmit a definition of it via an interchange mechanism.
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.10 Support filling the frame of a MIL-STD 2525-compliant symbol with
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.10.1 A specified color
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.10.2 For a specified region of the frame
Traceability: FRD 2.4
Priority 1
- 3.2.2.4.10.3 With an arbitrary supplied pixmap which is clipped to the frame.
Traceability: FRD 2.4
Priority 1
- 3.2.2.5 Support the display of a AOI reference map window associated with one or more other map windows.
Traceability: FRD 2.5
Priority 1
- 3.2.2.5.1 The AOI reference map window has a larger display scale to include an entire AOI, and includes a footprint for each of the associated map windows.
Traceability: FRD 2.5
Priority 1
- 3.2.2.5.2 Map layers can be added to the AOI reference map window.
Traceability: FRD 2.5
Priority 1

3.2.2.6	Support the maintenance of a subwindow associated with a map window, which depicts the same contents as that map window at an application-specified magnification.	Traceability: FRD 2.6 Priority 2
3.2.2.7	Support the display of selected metadata information about	Traceability: FRD 2.7 Priority 1
3.2.2.7.1	Data loaded	Traceability: FRD 2.7 Priority 1
3.2.2.7.2	Data available in the SDBMS data dictionary	Traceability: FRD 2.7 Priority 1
3.2.2.7.3	The SDBMS data dictionary	Traceability: FRD 2.7 Priority 1
3.2.2.7.4	Data products produced by DMA	Traceability: FRD 2.7 Priority 1
3.2.2.7.5	Available map layers	Traceability: FRD 2.7 Priority 1
3.2.2.7.6	Available map products	Traceability: FRD 2.7 Priority 1
3.2.2.7.7	Analysis results	Traceability: FRD 2.7 Priority 1
3.2.2.8	Support pan, zoom in and out, recentering, and home redisplay of the map window	Traceability: FRD 2.8 Priority 1
3.2.2.8.1	Be able to pan smoothly or in jumps based on	Traceability: FRD 2.8 Priority 1
3.2.2.8.1.1	Screen distance	Traceability: FRD 2.8 Priority 1
3.2.2.8.1.2	Geographic distance	Traceability: FRD 2.8 Priority 1
3.2.2.8.1.3	Percentage of a map window in all directions	Traceability: FRD 2.8 Priority 1

- 3.2.2.8.2 The AOI in which panning can be applied is application-defined or can be unconstrained.
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.3 Have the capability to move the center of a map window by
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.3.1 Placing the cursor at desired center point.
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.3.2 Inputting the desired coordinates.
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.4 Have the capability to resize a map window by placing the cursor at the desired center point or by inputting the desired center point coordinates along with the magnification and reduction factor
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.5 Have the capability to set specific scales from which to zoom
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.5.1 Specially handle integral zoom in or out of map layers that can be supported by pixel sampling or replication of raster data
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.6 Have a capability to resize the a map window by drawing a box around the area to be displayed via opposite corner input.
Traceability: FRD 2.8
Priority 1
- 3.2.2.8.7 Have the capability to resize the a map window display around a specified center point and a given radius from that point
Traceability: FRD 2.8
Priority 1
- 3.2.2.9 Provide capability to graphically display the availability of mapping data sets, their coverage and location, for all areas of the earth (polar and non-polar).
Traceability: FRD 2.9
Priority 1
- 3.2.2.9.1 The application will have the capability to graphically display the contents of the on-line and off-line databases, using information from the DMA digital catalog (MCS).
Traceability: FRD 2.9
Priority 1
- 3.2.2.9.2 The display will include the coverage and location of geographically referenced scanned material and other local geographically referenced data sets.
Traceability: FRD 2.9
Priority 1
- 3.2.2.10 Have the capability to manipulate symbology in map layers.
Traceability: FRD 2.10
Priority 1

3.2.2.10.1 Graphic objects will include

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.1 Polylines

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.2 Polymarkers

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.3 Circles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.4 Arcs

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.5 Ellipses

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.6 Rectangles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.7 Triangles

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.8 Polygons

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.9 Splines

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.10 Arrows

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.11 Text strings

Traceability: FRD 2.10
Priority 1

3.2.2.10.1.12 Multiple line segment

Traceability: FRD 2.10
Priority 1

3.2.2.10.2 The use of symbol libraries will be supported, and storage or retrieval of symbols in the libraries will be allowed.

Traceability: FRD 2.10
Priority 1

3.2.2.10.3 Support all of the symbols and operations on symbols specified in MIL-STD-2525 [See also MIL-STD 2526.]

Traceability: FRD 2.10
Priority 1

3.2.2.10.4 Support the creation of composite symbols that include multiple grouping of the symbols

Traceability: FRD 2.10
Priority 1

3.2.2.10.5 Predefined and application-defined polygon fill patterns in a library will be supported.

Traceability: FRD 2.10
Priority 1

3.2.2.10.6 Arbitrary graphic object creation will be supported through definition of polygon shape by an application-supplied or interactive drawing function.

Traceability: FRD 2.10
Priority 1

3.2.2.10.6.1 Generate and display Elevation Contour Polygons.

Traceability: FRD 2.10
Priority 1

3.2.2.10.6.2 Generate closed polygons for specified terrain elevations.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7 Symbol and map layer operations will include interactive functions such as move, resize, rotate, highlight, orient, etc. An application can control whether a symbol or map layer can be locked from being manipulated in this manner.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.1 Move an object using the cursor.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.2 Rotate the specified object utilizing the cursor.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.3 Rescale the specified object utilizing the cursor.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.4 Set the line style for the specified polyline primitive of the specified object.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.5 Set the line style for the specified vector primitive of the specified object.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.6 Set the width for the specified polyline primitive of the specified object.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.7 Set the width for the specified vector primitive of the specified object.

Traceability: FRD 2.10
Priority 1

3.2.2.10.7.8 Support the use of line patterns	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.9 Support the use of fill patterns and color selection of graphic objects	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.10 The application will be able to position graphically an object by its	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.10.1 Center	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.10.2 Corner points	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.10.3 Anchor point	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.10.4 Geocoordinate for its anchor point	Traceability: FRD 2.10 Priority 1
3.2.2.10.7.11 Be able to designate the anchor position pixel (i.e., "hot spot") for which the graphic object will be positioned	Traceability: FRD 2.10 Priority 1
3.2.2.10.8 Support the grouping and ungrouping of graphic objects	Traceability: FRD 2.10 Priority 1
3.2.2.10.8.1 Interactively allow picking of displayed feature or screen object.	Traceability: FRD 2.10 Priority 1
3.2.2.10.8.2 Interactive selection of map and feature.	Traceability: FRD 2.10 Priority 1
3.2.2.10.8.3 Interactively create and position an object.	Traceability: FRD 2.10 Priority 1
3.2.2.10.8.4 Display the points as polygons in the main window.	Traceability: FRD 2.10 Priority 1
3.2.2.10.8.5 Display the points as polylines in the main window.	Traceability: FRD 2.10 Priority 1

- 3.2.2.10.8.6 Display the points as polymarkers in the main window.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.7 Redraw the specified object if changed
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.8 Set the pick identifier for the current feature.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.9 Set the current pick center.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.10 Set the current pick radius.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.11 Set the current value of the pick threshold.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.8.12 Support pick points on the screen and then display the distance between those points.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.9 Have capability to create a text field which would either be associated with a symbol with a specified pixel offset or be another georeferenced symbol in a map layer
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.10 Text size, font, style, and orientation will be application-specified.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.10.1 Set the font for the specified marker primitive of the specified object.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.10.2 Set the font for the specified polymarker primitive of the specified object.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.10.3 Set the font for the named primitive.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.10.4 Set the font for the specified text primitive of the specified object.
Traceability: FRD 2.10
Priority 1
- 3.2.2.10.11 Be able to highlight a symbol or set of symbols by any of the following methods:
Traceability: FRD 2.10
Priority 1

3.2.2.10.11.1 Brightness	Traceability: FRD 2.10 Priority 1
3.2.2.10.11.2 Color	Traceability: FRD 2.10 Priority 1
3.2.2.10.11.3 Outlining	Traceability: FRD 2.10 Priority 1
3.2.2.10.11.4 Thickness enhancement	Traceability: FRD 2.10 Priority 1
3.2.2.10.11.5 Blinking	Traceability: FRD 2.10 Priority 1
3.2.2.11 Have the capability to hide and unhide	Traceability: FRD 2.11 Priority 1
3.2.2.11.1 Be able to add and remove feature classes.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.1 Features from a particular data source	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.2 Symbols or map layers.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.3 Delete Sensor Allocation target/threat features.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.4 Delete Sensor Allocation target visibility features.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.5 Delete and erase all objects from the current feature.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.6 Delete and erase the specified object from the current feature.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.7 Delete all objects for a given feature.	Traceability: FRD 2.11 Priority 1
3.2.2.11.1.8 Delete the terrain mask which is closest to the position given.	Traceability: FRD 2.11 Priority 1

- 3.2.2.11.1.9 Delete the terrain mask specified by the segment identifier.
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.1.10 Delete all terrain masks generated and displayed.
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.2 Decluttering and undecluttering will be
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.2.1 Keyed to particular scales
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.2.2 Keyed to specific areas to be displayed
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.2.3 Keyed by any combination of these techniques
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.2.4 Keyed by application-specified attributes
Traceability: FRD 2.11
Priority 1
- 3.2.2.11.3 For VPF data types, the decluttering of the display will allow applications to select each thematic layer of the data sets for display and non-display. The application will have the capability to declutter based on VPF primitives.
Traceability: FRD 2.11
Priority 1
- 3.2.2.12 Have the capability to change the color of any object in a map layer (excluding imagery and raster maps)
Traceability: FRD 2.12
Priority 1
- 3.2.2.12.1 Change the map layer color.
Traceability: FRD 2.12
Priority 1
- 3.2.2.12.2 Set the color for the object identifier.
Traceability: FRD 2.12
Priority 1
- 3.2.2.12.3 Set the feature color for the track history of the specified object.
Traceability: FRD 2.12
Priority 1
- 3.2.2.12.4 Set the track history visibility for the specified object.
Traceability: FRD 2.12
Priority 1
- 3.2.2.13 Provide the capability to create, edit, and display legend and metadata information for symbols, map layers analysis results, and MCG&I data.
Traceability: FRD 2.13
Priority 1

3.2.2.13.1 Size, shape, content and format will be definable	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.1 Display a legend of the coverage display features.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.2 Display the Precise Monoscopic Positioning (PMP) error of an ADRI point.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.3 Make the PMP legend no longer visible	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.4 Remove the Coverage legend from the display	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.5 Change the visibility for the ADRG legends indicated.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.6 Set the visibility of the specified object.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.7 Change the data for the specified polygon primitive of the specified object.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.8 Change the style for the specified polygon primitive of the specified object.	Traceability: FRD 2.13 Priority 1
3.2.2.13.1.9 Change the data for the specified polyline primitive of the specified object.	Traceability: FRD 2.13 Priority 1
3.2.2.13.2 Contents will include the accuracy and resolution information extracted from the original DMA data header information for the specific data used in a particular display	Traceability: FRD 2.13 Priority 1
3.2.2.13.3 Be able to include or have access to the legend information associated with the ADRG maps for both the general class of maps and the chart specific information	Traceability: FRD 2.13 Priority 1
3.2.2.13.4 Have the capability to display all attributes for all	Traceability: FRD 2.13 Priority 1
3.2.2.13.4.1 Map date information	Traceability: FRD 2.13 Priority 1

3.2.2.13.4.2 Accuracy information	Traceability: FRD 2.13 Priority 1
3.2.2.13.4.3 Series information	Traceability: FRD 2.13 Priority 1
3.2.2.13.4.4 Resolution information.	Traceability: FRD 2.13 Priority 1
3.2.2.13.4.5 Have the capability to query a location in a map background window for such information as map date, accuracy, series, resolution.	Traceability: FRD 2.13 Priority 1
3.2.2.13.5 Provide the capability to extract information from the database concerning objects that are displayed and related information. If the database contains information about communication links, then the application should display this as well.	Traceability: FRD 2.13 Priority 1
3.2.2.14 Have the capability to display grids for supported coordinate system on any map display.	Traceability: FRD 2.14 Priority 1
3.2.2.14.1 Latitude and longitude	Traceability: FRD 2.14 Priority 1
3.2.2.14.2 Gauss-Kruger, WAC/WAG	Traceability: FRD 2.14 Priority 1
3.2.2.14.3 Sexagesimal coordinates.	Traceability: FRD 2.14 Priority 1
3.2.2.14.4 Universal Transverse Mercator (UTM) grid	Traceability: FRD 2.14 Priority 1
3.2.2.14.5 Military Grid Reference System (MGRS)	Traceability: FRD 2.14 Priority 1
3.2.2.14.6 World Geographic Reference System (GEOREF) grid	Traceability: FRD 2.14 Priority 1
3.2.2.15 Have the capability to perform cursor-oriented queries on map.	Traceability: FRD 2.15 Priority 1
3.2.2.15.1 Will generate and display the geocoordinate lat/long/elevation coordinate sets corresponding to the location of the cursor	Traceability: FRD 2.15 Priority 1

- 3.2.2.15.1.1 Pick a point on the screen and then display its coordinates.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.1.2 Pick a point on the screen and display the elevation at that point.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.1.3 Produce a display of the magnitude of an areas slope.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.1.4 Display the angle between a picked line and either true or magnetic north.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.1.5 Display the distance and bearing between interactively chosen points.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.1.6 Interactively draw a polyline and display the distance and bearing.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.2 Coordinate generation will be a continuous operation or an "as-requested" operation
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.3 As with the positional coordinates, the ground elevation will also be available to the application if there is elevation data underlying the requested position.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.4 With all coordinates generated, an associated precision value for the placement of the cursor will be produced based on displayed resolution of the map background (pixel size) and cursor sensitivity.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.5 With all coordinates and elevations generated, an associated accuracy value will be created, based on the data used for the position (including precision of cursor placement) or elevation derivation.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.5.1 Display the accuracy of the current set of features on the map display.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.5.2 Display the Coordinate Precision of a point.
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.6 Be able to pick any feature or display selected associated attributes
Traceability: FRD 2.15
Priority 1
- 3.2.2.15.6.1 Allow to pick two points and display an intervisibility profile.
Traceability: FRD 2.15
Priority 1

3.2.2.15.6.2 Allow the application to pick a path on the screen and display an intervisibility profile of the path.

Traceability: FRD 2.15
Priority 1

3.2.2.15.6.3 Set the path coordinates to be used in the intervisibility functions.

Traceability: FRD 2.15
Priority 1

3.2.2.15.6.4 Set the maximum range to be used in the intervisibility functions.

Traceability: FRD 2.15
Priority 1

3.2.2.15.6.5 Be able to link an object within an overlay to database information for the object. If a communication link is represented by a line between station locations, it should be possible to click on the line to view the information in the database.

Traceability: FRD 2.15
Priority 1

3.2.2.15.7 Be able to support cursor pick of any graphic symbol in a map layer and provide the associated object identifier to the application

Traceability: FRD 2.15
Priority 1

3.2.2.16 Have the capability to perform pasteboard editing functions using pointing device.

Traceability: FRD 2.16
Priority 2

3.2.2.16.1 Annotate Pasteboard object.

Traceability: FRD 2.16
Priority 2

3.2.2.16.2 Create a Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.3 Cut an object.

Traceability: FRD 2.16
Priority 2

3.2.2.16.4 Cut an object and Store in Clipboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.5 Delete an object from the Clipboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.7 Create and Display a Pasteboard.

Traceability: FRD 2.16
Priority 2

3.2.2.16.8 Delete the Contents of the Pasteboard

Traceability: FRD 2.16
Priority 2

3.2.2.16.9 Paste an object onto the Pasteboard

Traceability: FRD 2.16
Priority 2

- 3.2.2.16.10 Restore the Previous Pasteboard.
Traceability: FRD 2.16
Priority 2
- 3.2.2.16.11 Use annotated object in Pasteboard.
Traceability: FRD 2.16
Priority 2
- 3.2.2.17 Be capable of displaying multiple separate and distinct map windows simultaneously
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.1 Have the capability of displaying a location in more than one map window simultaneously. When map windows have common areas of coverage, cursor movement in one display will be reflected by a marker in the corresponding window.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.2 Interactive functions will take place in only one map window at a time
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.3 Redraw all visible maps in the display configuration.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.4 Update the display to reflect changes made since the defer draw mode was set.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.5 Redraw the map with the given scale.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.6 Redraw the map with the given position at the center of the map display.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.7 Change the area of the screen in which the current map is drawn.
Traceability: FRD 2.17
Priority 2
- 3.2.2.17.8 Display the current map scale and the position of the map center.
Traceability: FRD 2.17
Priority 2
- 3.2.2.18 Include the capability for absolute and relative symbol scaling
Traceability: FRD 2.18
Priority 1
- 3.2.2.18.1 Absolute symbol scaling provides for the same size symbol no matter what zoom and rescaling function is initiated (symbol stays the same size)
Traceability: FRD 2.18
Priority 1
- 3.2.2.18.2 Relative symbol scaling provides for the symbol to reflect the scale of the zoom and rescaling function (symbol gets larger and smaller)
Traceability: FRD 2.18
Priority 1

3.2.2.19 Support the display of digitized color maps

Traceability: FRD 2.19
Priority 1

3.2.2.19.1 Have capability to display raster map data containing multiple color tables. The application will have the capability to select any one of the color tables that are provided (e.g., CADRG contains 3 color tables).

Traceability: FRD 2.19
Priority 1

3.2.2.19.2 Any map layer or vector feature may be combined with this map background.

Traceability: FRD 2.19
Priority 1

3.2.2.20 Provide the capability to display a terrain profile from elevation data selected from the SDBMS and vertical obstruction data provided in the SDBMS or provided by the application.

Traceability: FRD 2.20
Priority 2

3.2.2.20.1 Profile path will represent a straight line segment, a series of line segments or a linear feature from the cartographic data base

Traceability: FRD 2.20
Priority 2

3.2.2.20.2 Profile display will be labeled both vertically and horizontally

Traceability: FRD 2.20
Priority 2

3.2.2.20.3 Profile display will have a application-selectable vertical exaggeration and horizontal scale

Traceability: FRD 2.20
Priority 2

3.2.2.20.4 Have capability to display LOS with the terrain profile

Traceability: FRD 2.20
Priority 2

3.2.2.20.5 The profile view will display the surface of the earth as the highest elevation within a specified distance to the right and left of the profile baseline.

Traceability: FRD 2.20
Priority 2

3.2.2.20.6 Will mark vertical obstructions provided by the application or selected from the SDBMS within a specified distance to the right and left of the profile baseline.

Traceability: FRD 2.20
Priority 2

3.2.2.21 Provide the capability to display terrain perspective views utilizing elevation data, local geocoded and standard geocoded imagery and any of the features available in the data base. The features and representations are described in 1.9.

Traceability: FRD 2.21
Priority 1

3.2.2.21.1 Produce perspective views of terrain.

Traceability: FRD 2.21
Priority 1

- 3.2.2.21.2 Produce a Radar Envelope in a perspective window.
Traceability: FRD 2.21
Priority 1
- 3.2.2.21.3 Application can specify which map layers to drape in a perspective view.
Traceability: FRD 2.21
Priority 1
- 3.2.2.21.4 Generate contour polylines for specified terrain elevations.
Traceability: FRD 2.21
Priority 1
- 3.2.2.22 Will display the results of surface analysis for a given AOI.
Traceability: FRD 2.22
Priority 2
- 3.2.2.22.1 Will allow the display of surface feature coverage and vertical obstructions according to all thematic layers in the database. This includes vegetation, soils, transportation, drainage, slope, industry, and obstacles.
Traceability: FRD 2.22
Priority 2
- 3.2.2.22.2 Provide an interactive graphics interface and cataloging system to data bases.
Traceability: FRD 2.22
Priority 2
- 3.2.2.23 Provide an MCG&I data browsing function.
Traceability: FRD 2.23
Priority 2
- 3.2.2.23.1 Show available on-line and off-line data bases
Traceability: FRD 2.23
Priority 2
- 3.2.2.23.2 Choose desired input data bases.
Traceability: FRD 2.23
Priority 2
- 3.2.2.24 Each MCG&I display server provide support for multiple clients in the same window and for sharing of overlays among windows on separate client workstations.
Traceability: FRD 2.24
Priority 1
- 3.2.2.25 Support hardcopy of any map window or one or more map layers
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.1 Support selection of a geographic region for hardcopy
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.1.1 Which is identical to the geographic extent visible within a map window
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.1.2 Which can be of any extent, regardless of visibility in a map window
Traceability: FRD 2.25
Priority 1

- 3.2.2.25.2 Support CGM, Postscript, PCL, TIFF, NITFS, JPEG and HP GL
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.3 Support hardcopy to true scale (same scale as an associated paper map scale).
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.4 Support hardcopy to a specified or associated projection
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.5 Support the printing in north-up, track-up, and application other specified orientations
Traceability: FRD 2.25
Priority 1
- 3.2.2.25.6 Support multi-paged printouts in the case where the hardcopy size is smaller than the geographic region being hardcopied.
Traceability: FRD 2.25
Priority 1

JMTK 3.2.3 Spatial Database Management

- 3.2.3.1 Will perform data base management functions
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.1 Have the capability to import and export data sets in their standard format
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2 Will accept as input standard MCG&I data products from associated transfer and storage media.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1 Vector Product Format (VPF) data sets
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.1 WVS
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.2 All level of VMAP
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.3 ITD
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.4 Urban Vector Map
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.5 DFLIP
Traceability: FRD 3.1
Priority 1

- 3.2.3.1.2.1.6 Aeronautical Information DATA (AID)
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.7 Gazetteer (when available)
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.1.8 All other produced VPF data sets conforming to the VPF specification.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.2 Data sets conforming to the Raster Product Format (RPF), including CADRG and CIB.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.2.1 CADRG
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.2.2 CIB
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.2.3 Compressed Digital Terrain Elevation Data (when available).
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3 Will accept as input these data sets from their associated storage and distribution media
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3.1 DTED
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3.2 DAFIF
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3.3 ADRG
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3.4 Support a run-time "hasty" method for downsampling the 24-bit ADRG colors to fewer than 256 colors.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.3.5 Digital Point Positioning Database (Digital PPDB)
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.4 Will accept these non-maintained data sets from all their associated storage and distribution media.
Traceability: FRD 3.1
Priority 1

3.2.3.1.4.1	Digital feature analysis data (DFAD), levels 1, 1c, 2, 3c	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.2	World vector shoreline (WVS) in Standard Linear Format (SLF)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.3	Digital chart of the world (DCW)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.4	Probabilistic vertical obstruction data (PVOD)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.5	Digitized point positioning data base (Digitized PPDB)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.6	Arc digital raster imagery (ADRI)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.7	Compressed Aeronautical Chart (CAC) (NV)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.8	E-MAP (AR)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.9	DADRG (AR)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.10	Common Mapping Standard (CMS)	Traceability: FRD 3.1 Priority 1
3.2.3.1.4.11	Interim Terrain Data (ITD) and Planning Interim Terrain Data (PITD) in SLF	Traceability: FRD 3.1 Priority 1
3.2.3.1.5	Handle data file formats used by commercial image processing	Traceability: FRD 3.1 Priority 1
3.2.3.1.6	Support elevation data in application-specified resolutions.	Traceability: FRD 3.1 Priority 1
3.2.3.1.7	Store analysis values for such functions as mobility and terrain	Traceability: FRD 3.1 Priority 1
3.2.3.1.7.1	Mobility and terrain	Traceability: FRD 3.1 Priority 1

- 3.2.3.1.7.2 Store analysis values with metadata including a time and date stamp
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.8 Save/Store map layers or data in supported formats (e.g., RPF or VPF). The files may represent both raster and vector data.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.8.1 Save the state and display configuration of the current map for later use.
Traceability: FRD 3.1
Priority 1
- 3.2.3.1.8.2 Store Perspective information and image geometry.
Traceability: FRD 3.1
Priority 1
- 3.2.3.2 Support a data dictionary which includes data definitions for spatial data entities, relationships, and attributes
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.1 Provide data dictionary values for all supported data formatted data formats and products.
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.2 Support
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.2.1 Create
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.2.2 Update
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.2.3 Delete
Traceability: FRD 3.2
Priority 2
- 3.2.3.2.2.4 Report of data in the data dictionary
Traceability: FRD 3.2
Priority 2
- 3.2.3.3 Store metadata in a format defined by the document TBD.
Traceability: FRD 3.3
Priority 2
- 3.2.3.4 Support management of source data files for MCG&I data products
Traceability: FRD 3.4
Priority 1
- 3.2.3.4.1 Copy
Traceability: FRD 3.4
Priority 1

3.2.3.4.2	Rename	Traceability: FRD 3.4 Priority 1
3.2.3.4.3	Move	Traceability: FRD 3.4 Priority 1
3.2.3.4.4	Delete	Traceability: FRD 3.4 Priority 1
3.2.3.4.5	Allow for stacking	Traceability: FRD 3.4 Priority 1
3.2.3.4.6	Allow for subsetting	Traceability: FRD 3.4 Priority 1
3.2.3.4.7	Allow for paneling	Traceability: FRD 3.4 Priority 1
3.2.3.4.8	Allow for integration of geographic data sets.	Traceability: FRD 3.4 Priority 1
3.2.3.4.9	Provide capability to retrieve a list of data base file names.	Traceability: FRD 3.4 Priority 1
3.2.3.4.9.1	Provide a list of both on-line and off-line databases filtered by data base type and scale for text display and output	Traceability: FRD 3.4 Priority 1
3.2.3.4.9.2	Have the capability to read and use DMA digital catalog, Modernized Catalog System (MCS).	Traceability: FRD 3.4 Priority 1
3.2.3.4.9.3	Geographic reference, data base type and scale for text display and output.	Traceability: FRD 3.4 Priority 1
3.2.3.4.9.4	Will allow examining of listing of locally-produced geographic databases, writebacks, and other geographically-referenced scanned material.	Traceability: FRD 3.4 Priority 1
3.2.3.4.10	Provide capability to retrieve (See Paragraph 2.9).	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.1	File size	Traceability: FRD 3.4 Priority 1

3.2.3.4.10.2 File contents	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.3 Data base accuracy	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.4 Other available metadata information such as	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.4.1 Currency date	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.4.2 Resolution	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.4.3 Source datum in accordance with FGDC metadata content standard (FIP PUB TBD)	Traceability: FRD 3.4 Priority 1
3.2.3.4.10.5 The specified data source, accuracy, and scale used to establish the precision of coordinate displays.	Traceability: FRD 3.4 Priority 1
3.2.3.4.11 Provide backup and restore of files to and from removable storage media.	Traceability: FRD 3.4 Priority 1
3.2.3.4.12 Provide a capability to import and export MCG&I files.	Traceability: FRD 3.4 Priority 1
3.2.3.4.12.1 Support interactive transfer of AOI data bases to writable media supported storage	Traceability: FRD 3.4 Priority 1
3.2.3.4.13 Determine if one point is visible at the position of the start point	Traceability: FRD 3.4 Priority 1
3.2.3.5 Store and manage graphical information produced by the JMTK.	Traceability: FRD 3.5 Priority 2
3.2.3.5.1 Store	Traceability: FRD 3.5 Priority 2
3.2.3.5.2 Retrieve	Traceability: FRD 3.5 Priority 2

3.2.3.5.3	Report graphic snapshots of map layers with graphic symbology.	Traceability: FRD 3.5 Priority 2
3.2.3.5.4	Support import and export of graphic data in	Traceability: FRD 3.5 Priority 2
3.2.3.5.4.1	NITF formats	Traceability: FRD 3.5 Priority 2
3.2.3.5.4.2	CGM formats	Traceability: FRD 3.5 Priority 2
3.2.3.5.4.3	TIFF formats	Traceability: FRD 3.5 Priority 2
3.2.3.6	Support projection and datum transformations of all on-line spatial data bases.	Traceability: FRD 3.6 Priority 1
3.2.3.6.1	Polar stereographic	Traceability: FRD 3.6 Priority 1
3.2.3.6.2	Transverse Mercator	Traceability: FRD 3.6 Priority 1
3.2.3.6.3	Lambert conformal	Traceability: FRD 3.6 Priority 1
3.2.3.6.4	Cylindrical equal-distant	Traceability: FRD 3.6 Priority 1
3.2.3.6.5	Equal Arc-Second Raster Chart and Map (ARC)	Traceability: FRD 3.6 Priority 1
3.2.3.6.6	Projection and datum transformations will be based on	Traceability: FRD 3.6 Priority 1
3.2.3.6.6.1	DMA technical manual 8358	Traceability: FRD 3.6 Priority 1
3.2.3.6.6.2	DMA technical report 8350	Traceability: FRD 3.6 Priority 1
3.2.3.6.6.3	USGS professional paper 1395	Traceability: FRD 3.6 Priority 1

3.2.3.6.6.4 Transformation and coordinate conversions between all the datum listed in these three documents will be provided.

Traceability: FRD 3.6
Priority 1

3.2.3.6.7 Transformations will be based on spheroid and datum of input coordinate(s) and desired spheroid and datum of output coordinate(s)

Traceability: FRD 3.6
Priority 1

3.2.3.6.8 A standard list of supported spheroids and datums can be requested and provided.

Traceability: FRD 3.6
Priority 1

3.2.3.7 Support input and storage, query, and retrieval of image and graphics data formatted in the version 1.1 and 2.0 of the National Imagery Transmission Format Standard (NITF).

Traceability: FRD 3.7
Priority 1

3.2.3.7.1 Input

Traceability: FRD 3.7
Priority 1

3.2.3.7.2 Storage

Traceability: FRD 3.7
Priority 1

3.2.3.7.3 Query and retrieval of image

Traceability: FRD 3.7
Priority 1

3.2.3.7.4 Graphics data formatted in the version 1.1 and 2.0 of the National Imagery Transmission Format Standard (NITF)

Traceability: FRD 3.7
Priority 1

3.2.3.8 Support the decompression of input data bases that have been previously compressed.

Traceability: FRD 3.8
Priority 1

3.2.3.8.1 NITF compression schemes

Traceability: FRD 3.8
Priority 1

3.2.3.8.2 Digitized map compression scheme

Traceability: FRD 3.8
Priority 1

3.2.3.8.3 Imagery compression scheme

Traceability: FRD 3.8
Priority 1

3.2.3.9 Support creation of areas-of-interest (AOI) of any size with any combination of available standard input data bases and scales as selected by the application

Traceability: FRD 3.9
Priority 1

3.2.3.10 Support Data Query for the following	Traceability: FRD 3.10 Priority 1
3.2.3.10.1 The visibility of the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.2 The name of the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.3 The name of the selected map in the display configuration.	Traceability: FRD 3.10 Priority 1
3.2.3.10.4 The name of the selected overlay.	Traceability: FRD 3.10 Priority 1
3.2.3.10.5 The visibility of the selected map.	Traceability: FRD 3.10 Priority 1
3.2.3.10.6 The visibility of the selected overlay.	Traceability: FRD 3.10 Priority 1
3.2.3.10.7 The area of interest for the selected map.	Traceability: FRD 3.10 Priority 1
3.2.3.10.8 List of the names of the maps associated with the selected display configuration.	Traceability: FRD 3.10 Priority 1
3.2.3.10.9 List of the names of the overlays associated with the selected map.	Traceability: FRD 3.10 Priority 1
3.2.3.10.10 The range of the selected map window to view surface coordinates.	Traceability: FRD 3.10 Priority 1
3.2.3.10.11 The projection type for the selected map.	Traceability: FRD 3.10 Priority 1
3.2.3.10.12 The position of the selected map center.	Traceability: FRD 3.10 Priority 1
3.2.3.10.13 The selected map scale.	Traceability: FRD 3.10 Priority 1
3.2.3.10.14 The range of the selected map window in latitude/longitude coordinates.	Traceability: FRD 3.10 Priority 1

3.2.3.10.15	List of the names of the features associated with the selected overlay.	Traceability: FRD 3.10 Priority 1
3.2.3.10.16	The number of the selected overlay.	Traceability: FRD 3.10 Priority 1
3.2.3.10.17	The color associated with the specified index in the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.18	The latitude/longitude coordinates of each point of a drawn polygon.	Traceability: FRD 3.10 Priority 1
3.2.3.10.19	The latitude/longitude coordinates of a drawn polyline.	Traceability: FRD 3.10 Priority 1
3.2.3.10.20	The coordinates of a picked point.	Traceability: FRD 3.10 Priority 1
3.2.3.10.21	The two corner points of a drawn rectangle.	Traceability: FRD 3.10 Priority 1
3.2.3.10.22	The distance over terrain between interactively picked points.	Traceability: FRD 3.10 Priority 1
3.2.3.10.23	The selected visibility of the ADRG legend indicated.	Traceability: FRD 3.10 Priority 1
3.2.3.10.24	The visibility of the Coordinate Precision window.	Traceability: FRD 3.10 Priority 1
3.2.3.10.25	The visibility of the coverage legend.	Traceability: FRD 3.10 Priority 1
3.2.3.10.26	The visibility of the map legend.	Traceability: FRD 3.10 Priority 1
3.2.3.10.27	The visibility of the PMP error legend.	Traceability: FRD 3.10 Priority 1
3.2.3.10.28	The map and feature being used for the selected display.	Traceability: FRD 3.10 Priority 1
3.2.3.10.29	The visibility of the selected inset.	Traceability: FRD 3.10 Priority 1

- 3.2.3.10.30 List of all the maps and features of the selected display configuration.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.31 List of the names of the colors in the selected device file.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.32 The selected state of the background mode flag.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.33 List of the format names in the selected format file.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.34 The number of primitives in the selected format.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.35 List of the ids of all the objects in the selected feature.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.36 The parameters of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.36.1 The position of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.36.2 The rotation of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.36.3 The scale factors of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.37 The text string for the requested primitive.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.38 The visibility of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.39 The visibility of the selected primitive in the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.40 The data for the specified informational primitive of the specified object.
Traceability: FRD 3.10
Priority 1
- 3.2.3.10.41 The color for the primitive number within the specified object.
Traceability: FRD 3.10
Priority 1

3.2.3.10.42	The font file pathname for the requested primitive.	Traceability: FRD 3.10 Priority 1
3.2.3.10.43	The position for the named primitive.	Traceability: FRD 3.10 Priority 1
3.2.3.10.44	The style attributes for the specified primitive.	Traceability: FRD 3.10 Priority 1
3.2.3.10.45	The type of the given primitive in the selected format.	Traceability: FRD 3.10 Priority 1
3.2.3.10.46	The visibility of the track history of the specified object if the history is on.	Traceability: FRD 3.10 Priority 1
3.2.3.10.47	The pick value for the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.48	The pick value for the specified object.	Traceability: FRD 3.10 Priority 1
3.2.3.10.49	The selected value of the pickability flag for the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.50	The selected pick center in screen pixel coordinates.	Traceability: FRD 3.10 Priority 1
3.2.3.10.51	The selected pick radius in units of pixels.	Traceability: FRD 3.10 Priority 1
3.2.3.10.52	The selected value of the pick threshold.	Traceability: FRD 3.10 Priority 1
3.2.3.10.53	List of pickable objects for the selected feature.	Traceability: FRD 3.10 Priority 1
3.2.3.10.54	List of objects within a polygon that qualify for a pick.	Traceability: FRD 3.10 Priority 1
3.2.3.10.55	Whether the specified object is highlighted, and the highlight color.	Traceability: FRD 3.10 Priority 1
3.2.3.10.56	List of the ids of all the object links.	Traceability: FRD 3.10 Priority 1

3.2.3.10.57	Information about the specified link.	Traceability: FRD 3.10 Priority 1
3.2.3.10.58	The selected visibility of an object link.	Traceability: FRD 3.10 Priority 1
3.2.3.10.59	The radar parameters used specifically by the Radar Target Detection function.	Traceability: FRD 3.10 Priority 1
3.2.3.10.60	The radar parameters for a specified radar.	Traceability: FRD 3.10 Priority 1
3.2.3.10.61	The line-of-sight distance and visibility from one point to another.	Traceability: FRD 3.10 Priority 1
3.2.3.10.62	The earth type used to generate a terrain mask. Query Terrain Masks.	Traceability: FRD 3.10 Priority 1
3.2.3.10.63	The angle off true or magnetic north for two interactively picked points.	Traceability: FRD 3.10 Priority 1
3.2.3.10.64	The terrain elevation of an interactively picked point.	Traceability: FRD 3.10 Priority 1
3.2.3.10.65	The coordinates of an interactively picked point.	Traceability: FRD 3.10 Priority 1
3.2.3.10.66	List of minimum and maximum elevations within a given AOI.	Traceability: FRD 3.10 Priority 1
3.2.3.10.67	The vehicle parameters for a specified vehicle.	Traceability: FRD 3.10 Priority 1
3.2.3.10.68	The distance along a three-dimensional air path.	Traceability: FRD 3.10 Priority 1
3.2.3.10.69	The distance along a ground path.	Traceability: FRD 3.10 Priority 1
3.2.3.10.70	The distance between two positions.	Traceability: FRD 3.10 Priority 1
3.2.3.10.71	The position of the light source of a relief shade.	Traceability: FRD 3.10 Priority 1

3.2.3.10.72	The value from a data base grid corresponding to a given map coordinate.	Traceability: FRD 3.10 Priority 1
3.2.3.10.73	The bearing between two positions.	Traceability: FRD 3.10 Priority 1
3.2.3.10.74	The elevation of the given world coordinate position.	Traceability: FRD 3.10 Priority 1
3.2.3.10.75	Selected display precision settings.	Traceability: FRD 3.10 Priority 1
3.2.3.10.76	The great circle distance between two interactively picked points.	Traceability: FRD 3.10 Priority 1
3.2.3.10.77	The distance between interactively picked points.	Traceability: FRD 3.10 Priority 1
3.2.3.10.78	The visibility of the map accuracy legend.	Traceability: FRD 3.10 Priority 1
3.2.3.10.79	The ASCII version of a double floating point number to a given precision.	Traceability: FRD 3.10 Priority 1
3.2.3.10.80	The ASCII version of a floating point number to a given precision.	Traceability: FRD 3.10 Priority 1
3.2.3.10.81	Load a new fill pattern.	Traceability: FRD 3.10 Priority 1
3.2.3.10.82	Elevation accuracy data for a given lat/long	Traceability: FRD 3.10 Priority 1
3.2.3.10.83	Provide a capability to query based on region, data or product type, features, classes, and attributes.	Traceability: FRD 3.10 Priority 1
3.2.3.10.84	Queries with a location and a proximity range	Traceability: FRD 3.10 Priority 1
3.2.3.10.85	Containment queries	Traceability: FRD 3.10 Priority 1

3.2.3.10.86 Adjacency queries

Traceability: FRD 3.10
Priority 1

3.2.3.10.87 Spatial metric queries (length, area, distance, azimuth)

Traceability: FRD 3.10
Priority 1

3.2.3.10.88 Boolean combination of queries

Traceability: FRD 3.10
Priority 1

3.2.3.11 Will perform matrix merging of similar matrix features from the database.

Traceability: FRD 3.11
Priority 2

3.2.3.12 Coordinate conversion will be supported among the following coordinate, and will comply with DMA TM-8358

Traceability: FRD 3.12
Priority 1

3.2.3.13 Store metadata in a format defined by document TBD.

Traceability: FRD 3.13
Priority 3

3.2.3.14 Support Digital Chart Update (DCHUM) display and management.

Traceability: FRD 3.14
Priority 2

JMTK 3.2.4 Local Imagery Preprocessing

3.2.4.1 Will assess the presence and accuracy of ancillary control information of local imagery

Traceability: FRD 4.1
Priority 2

3.2.4.1.1 Convert various types of control information to common equivalent values

Traceability: FRD 4.1
Priority 2

3.2.4.1.2 Process accuracy descriptions to common standard evaluations (90% absolute, relative, CE, LE & SE)

Traceability: FRD 4.1
Priority 2

3.2.4.1.3 Determine acceptability and completeness of data for geocoding process

Traceability: FRD 4.1
Priority 2

3.2.4.2 Will register and either control or re-control local imagery to geographic coordinates for geocoding

Traceability: FRD 4.2
Priority 2

3.2.4.2.1 Mensurate ADRI to provide precise monoscopic positioning coordinate of control point

Traceability: FRD 4.2
Priority 2

- 3.2.4.2.2 Mensurate conjugate point in local image
Traceability: FRD 4.2
Priority 2
- 3.2.4.2.3 Calculate and evaluate polynomial transform of entire local image to ADRI space. Re-mensurate imageries and re-evaluate transform to achieve appropriate level of accuracy
Traceability: FRD 4.2
Priority 2
- 3.2.4.2.4 Accept computation of controlling data and store for geocoding process
Traceability: FRD 4.2
Priority 2
- 3.2.4.3 Will utilize derived or input control information and DTED to resample imagery to geocoded format
Traceability: FRD 4.3
Priority 2
- 3.2.4.3.1 Perform resampling to transform input local imagery to a universal equal arc-second projection system (ADRI projection).
Traceability: FRD 4.3
Priority 2
- 3.2.4.3.2 Perform image tiling or tessellation to place imagery in standard format.
Traceability: FRD 4.3
Priority 2
- 3.2.4.3.3 Create additional geocoded imagery scales as necessary to retain resolution or avoid replication of imagery.
Traceability: FRD 4.3
Priority 2
- 3.2.4.4 Will process and store local imagery as either geocoded or ungeocoded local imagery.
Traceability: FRD 4.4
Priority 2
- 3.2.4.4.1 Ungeocoded imagery may or may not be compressed before storage, at operator discretion.
Traceability: FRD 4.4
Priority 2
- 3.2.4.4.2 All geocoded imageries will be compressed.
Traceability: FRD 4.4
Priority 2
- 3.2.4.4.3 Store as separate (overlay capable) file on locally-controlled non-permanent storage.
Traceability: FRD 4.4
Priority 2
- 3.2.4.4.4 Retain imagery blocking to facilitate random access retrieval of blocks when stored.
Traceability: FRD 4.4
Priority 2
- 3.2.4.4.5 Use only the specified image compression method. Scan maps and imagery and convert to RPF formats
Traceability: FRD 4.4
Priority 2
- 3.2.4.5 Will perform precise monoscopic positioning based upon local geocoded imageries.
Traceability: FRD 4.5
Priority 3

- 3.2.4.5.1 Derive positional coordinates of selected points mensurated on local geocoded imagery.
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.2 Overlay geocoded local imagery directly over standard imagery. Permit imagery of different scales to be merged retaining best quality data value
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.3 Calculate absolute error of point positions at 90% CE, LE and SE from contributors:
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.3.1 Elevation data
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.3.2 Local geocoded imagery
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.3.3 Display scale
Traceability: FRD 4.5
Priority 3
- 3.2.4.5.3.4 Cursor position
Traceability: FRD 4.5
Priority 3
- 3.2.4.6 Will perform point transfer positioning from uncontrolled imageries to:
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.1 ADRI standard imagery
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.2 CIB data
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.3 Generate pairs of conjugate point coordinates from uncontrolled local imagery and geocoded imageries via operator selection which surround area and points of interest. See Note 3.
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.4 Evaluate computed transform at points and area of interest for accuracy (relative and absolute)
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.5 Derive positional coordinates of points of interest mensurated on uncontrolled image.
Traceability: FRD 4.6
Priority 3
- 3.2.4.6.6 Calculate absolute error of point positions at 90% CE, LE and SE from contributors:
Traceability: FRD 4.6
Priority 3

3.2.4.6.6.1 Elevation data	Traceability: FRD 4.6 Priority 3
3.2.4.6.6.2 ADRI Standard Imagery	Traceability: FRD 4.6 Priority 3
3.2.4.6.6.3 CIB data	Traceability: FRD 4.6 Priority 3
3.2.4.6.6.4 Displayed scale	Traceability: FRD 4.6 Priority 3
3.2.4.6.6.5 Cursor Precision	Traceability: FRD 4.6 Priority 3
3.2.4.6.6.6 Point transfer polynomial	Traceability: FRD 4.6 Priority 3
3.2.4.6.7 Have the capability to produce National Imagery Transmission Formatted (NITF) data from uncontrolled local imagery.	Traceability: FRD 4.6 Priority 3
3.2.4.7 Image enhancement will be available to improve the quality of displayed imagery (e.g., contrast stretching, etc.).	Traceability: FRD 4.7 Priority 3
3.2.4.7.1 Apply automated Linear Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.2 Apply average CDF (Ramp CDF) Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.3 Apply brightness (Contrast Enhancement).	Traceability: FRD 4.7 Priority 3
3.2.4.7.4 Apply the Canny Edge Detector.	Traceability: FRD 4.7 Priority 3
3.2.4.7.5 Apply a linear contrast enhancement to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.6 Apply difference of Gaussian filter.	Traceability: FRD 4.7 Priority 3

3.2.4.7.7 Apply an edge sharpening filter to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.8 Apply an area edge filter to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.9 Apply a point edge filter to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.10 Apply an edge preserving smoothing filter to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.11 Apply Gaussian curve point edge detector to the image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.12 Apply Gaussian filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.13 Apply Automated Linear Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.14 Apply High Pass Average filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.15 Apply High Pass Median filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.16 Apply an edge preserving smoothing filter to an image.	Traceability: FRD 4.7 Priority 3
3.2.4.7.17 Apply Laplacian #1 convolution filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.18 Apply Laplacian #3 convolution filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.19 Apply Laplacian #2 convolution filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.20 Apply Manual Linear Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.21 Apply maximum filter.	Traceability: FRD 4.7 Priority 3

3.2.4.7.22 Apply minimum filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.23 Apply Noise Reduction Modal.	Traceability: FRD 4.7 Priority 3
3.2.4.7.24 Apply Noise Reduction Outlier Removal filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.25 Apply Pavlidis Local Average Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.26 Apply Pavlidis Random CDF Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.27 Apply Piecewise Linear Contrast Enhancement.	Traceability: FRD 4.7 Priority 3
3.2.4.7.28 Apply Prewitt Horizontal Edge Detection filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.29 Apply Prewitt Horizontal & Vertical Edge Detection filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.30 Apply Prewitt Vertical Edge Detection filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.31 Apply Reverse Video image filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.32 Apply Smoothing Average filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.33 Apply Smoothing Median filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.34 Apply Sobel Horizontal Edge Detection filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.35 Apply Sobel Horizontal & Vertical filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.36 Apply Threshold above value filter.	Traceability: FRD 4.7 Priority 3

3.2.4.7.37 Apply Threshold below value filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.38 Apply Threshold between value filter.	Traceability: FRD 4.7 Priority 3
3.2.4.7.39 Perform image Tiepoint Analysis.	Traceability: FRD 4.7 Priority 3
3.2.4.7.40 Perform Image Registration.	Traceability: FRD 4.7 Priority 3
3.2.4.8 Provide rudimentary and basic image processing functions.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1 Image enhancement will be available to perform contrast stretching on imagery.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.1 Rasterize area feature into grid.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.2 Rasterize line feature into grid.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.3 Rasterize point feature into grid.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.4 Display Area Gradient raster output.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.5 Change the visibility of the current map.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.6 Change a features visibility.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.7 Change the visibility of the current overlay.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.8 Convert a 24 bit image to an 8 bit image, then displays it in a dynamic window.	Traceability: FRD 4.8 Priority 2
3.2.4.8.1.9 Convert a 24 bit image to an 8 bit image, then displays it in a widget.	Traceability: FRD 4.8 Priority 2

- 3.2.4.8.1.10 Fade the previously initialized feature by the percent indicated.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.11 Restore faded feature to its original color.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.12 Generate Fast Perspective as an 8 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.13 Generate a Radar Envelope over a Perspective view as a 24 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.14 Interactively select and extracts an area of a screen image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.15 Generate FLIR return as an 8 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.16 Generate LLLTV return as an 8 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.17 Generate Radar return as a 8 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.18 Generate Synthetic Aperture Radar (SAR) and make available as an 8 bit image.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.19 Map a 24-bit image to color colormap indices.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.1.20 Map an 8-bit image to gray scale colormap indices.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2 Rotation of the map windows, including all map layers, will be provided.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.1 Allow the interactive acceptance or rejection of the generated object filter.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.2 Display an 8-bit image in a scrolled window.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.3 Create a gray scale colormap.
Traceability: FRD 4.8
Priority 2

- 3.2.4.8.2.4 Apply and plot an area edge filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.5 Apply and plot an equal probability quantified filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.6 Apply and plot a floating point smoothing filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.7 Apply and plot an integer smoothing filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.8 Apply and plot a point edge detection filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.9 Apply and plot a Sobel filter to the designated image area.
Traceability: FRD 4.8
Priority 2
- 3.2.4.8.2.10 Apply and plot an edge sharpening filter to the designated image area.
Traceability: FRD 4.8
Priority 2

3.2.5 Requirements Submitted by the Army

- 3.2.5.1 MCG&I shall provide an interface to COTS software necessary for applications to utilize the following DBMS capabilities:
 - 3.2.5.1.1 Ad hoc (i.e., relational, spatial, and combined) database queries.
Traceability: ARMY, 20 July 1996
Priority ???
- 3.2.5.2 MCG&I shall provide the capability for an application to select a feature(s) from a map by its type and geographic location according to the following rules:
 - 3.2.5.2.1 If one feature exists at the geographic location, then that feature is selected.
Traceability: ARMY, 20 July 1996
Priority ???
- 3.2.5.3 MCG&I shall provide the capability to perform, at the request of an application program, comparisons of elevation data that result in the following products which can be passed to the application program:
 - 1. Target acquisition
Traceability: ARMY, 20 July 1996
Priority ???
 - 2. Multiple site target acquisition
Traceability: ARMY, 20 July 1996
Priority ???

- 3.2.5.4 FAAD C2 systems requires the ability to create, display, and delete sensor (Ground Based Sensor and Light and Special Division Interim Sensor) terrain coverage overlays at various flight altitudes above ground level. Create implies the need to specify the parameters.

Traceability: ARMY, 20 July 1996
Priority ???

- 3.2.5.5 FAAD C2 CRTD software requires support for a shot opportunity map overlay for a specific laydown of sensors and weapons.

Traceability: ARMY, 20 July 1996
Priority ???

- 3.2.5.6 FAAD C2 systems requires the ability to display FAAD fire unit responsibility coverage zones.

Traceability: ARMY, 20 July 1996
Priority ???

- 3.2.5.7 FAAD requires the ability to generate a map background from multiple DMA ADRG CD ROM media. The multiple media requirement implies the ability to generate a seamless map background from more than one CD ROM.

Traceability: ARMY, 20 July 1996
Priority ???

3.2.6 Requirements Submitted by the Marines

- 3.2.6.1 Communications Services shall support the Front Line of Own Troops line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.2 Communications Services shall support the Obstacle line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.3 Communications Services shall support the Fortified line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.4 Communications Services shall support the Reconnaissance line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.5 Communications Services shall support the Route line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.6 Communications Services shall support the Bridge line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.7 Communications Services shall support the Delaying Action line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.8 Communications Services shall support the Lane/Path line type, as defined in FM 101-5-1.

Traceability: JMCIS Overlays FDD 3.1
Priority ???

- 3.2.6.9 Communications Services shall support the Ferry line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.10 Communications Services shall support the Antitank Ditch line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.11 Communications Services shall support the Antipersonnel Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.12 Communications Services shall support the Antitank Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.13 Communications Services shall support the Antitank Mine with Antihandling Device line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.14 Communications Services shall support the Unspecified Mine line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.15 Communications Services shall support the Boundary line type, as defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.16 Communications Services shall support the Phase Line line type, as defined in FM 101-5-1..
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.17 Communications Services shall support the Antipersonnel Mine area fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.18 Communications Services shall support the Antitank Mine fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.19 Communications Services shall support the Antitank Mine with Antihandling Device fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.20 Communications Services shall support Unspecified Mine fill type, using basic symbols defined in FM 101-5-1.
Traceability: JMCIS Overlays FDD 3.1
Priority ???
- 3.2.6.21 Communications Services shall provide user interface to specify two Unique Designations for Boundary Lines in overlays.
Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.22 Communications Services shall provide user interface to specify a Size Indicator for Boundary Lines in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.23 Communications Services shall support Section/Squad (12) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.24 Communications Services shall support Platoon/Detachment (36) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.25 Communications Services shall support Company/Battery/Troop (150-200) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.26 Communications Services shall support Battalion/Squadron (450-1000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.27 Communications Services shall support Group/Regiment (1500-3000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.28 Communications Services shall support Brigade (5000-7000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.29 Communications Services shall support Division (15000-21000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.30 Communications Services shall support Corps (45000-60000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.31 Communications Services shall support Army (105000-180000) size indicator in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.32 Communications Services shall automatically display the two Unique Designations and size indicator with the appropriate symbol against the geographic map

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.33 Communications Services shall provide user interface to specify assigned letters for Phase Lines in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.34 Communications Services shall provide user interface to specify numbers for Phase Lines in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.35 Communications Services shall provide user interface to specify code names for Phase Lines in overlays.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.36 Communications Services shall automatically display the assigned letters, numbers, and code names for Phase Lines with the appropriate symbol against the geographic map.

Traceability: JMCIS Overlays FDD 3.2
Priority ???

3.2.6.37 Communications Services shall provide user interface to graphically specify ground axis of advance.

Traceability: JMCIS Overlays FDD 3.3
Priority ???

3.2.6.38 Communications Services shall provide user interface to graphically specify air axis of advance.

Traceability: JMCIS Overlays FDD 3.3
Priority ???

3.2.6.38 Communications Services shall provide user interface to graphically specify air axis of advance.

Traceability: JMCIS Overlays FDD 3.3
Priority ???